Acta Geodynamica et Geomaterialia 2005 vol.2 N2, pages 47-52

Physico-chemical mechanics of clay swelling

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Abstract

The mathematical model of the swelling systems rheology is considered. As a basis of a model the generalization of the consolidation theory was used on a case when the mass of a solid phase of a porous skeleton changes due to an overflow of a fluid during processes of swelling / shrinkage under action of osmotic pressure. The problem of swelling / shrinkage of a clay layer is put and solved. On the basis of the analysis the decision features of a model, important for the explanation of some characteristic properties of processes in swelling systems, are investigated. It is shown, that the received decisions are in the good consent with results of experiments.

Keywords

Clays, Mathematical model, Rheology, Swelling